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10/719,550	11/21/2003	Chih-Chun Yang	67,200-1109	3429

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EXAMINER
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CHEN, KIN CHAN

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* CHIH-CHUN YANG and TUNG-CHIN YEH

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Appeal 2008-002790  
Application 10/719,550  
Technology Center 1700

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Decided: August 31, 2009

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Before JEFFREY T. SMITH, BEVERLY A. FRANKLIN, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Statement of the Case

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1-3, 5, 7, 9-15, 17, 19, and 21-25, all of the pending claims. We have jurisdiction under 35 U.S.C. § 6.

Appellants' invention relates to a process for removing oxidized metal residues from a metal structure. Representative independent claim 1, as presented in the Brief, appears below:

1. A process for removing oxidized metal residues from a metal structure, comprising the steps of:  
providing a metal layer;  
planarizing the metal layer to form a metal plug structure to leave the metal residues on the metal plug structure;  
providing an oxidant solution;  
heating said oxidant solution to a temperature of at least 60 degree C;  
and  
applying said oxidant solution to the metal plug structure to remove said metal residues comprising oxidized metal.

Appellants appeal the following rejections:

- I. Claims 13-15, 17, 19, and 21-25 stand rejected under 35 U.S.C. § 112, first paragraph, as not complying with the written description requirement.
- II. Claims 1, 2, 5, 9, 10, 12-14, 17, and 21-25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Lee, U.S. Patent application 2003/0228990A1, published December 11, 2003, in view of Appellants' admitted prior art in the Specification, as evidenced by Chou, US Patent 6,235,644, issued May 22, 2001, Shinohara, US Patent 6,355,553, issued March 12, 2002, and Kadomura, US Patent 5,227,337, issued July 13, 1993.
- III. Claims 3, 7, 11, 15, and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Lee, in view of Appellants admitted prior art in the specification, as evidenced by Chou, Shinohara, and Kadomura, and further in view of Wolf (Silicon Processing, Volume 1, page 51) or Verhaverbeke US Patent 5,972,123, issued October 26, 1999.

The § 112, first paragraph rejection.

Claims 13-15, 17, 19, and 21-25 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the original Specification in such a way as to reasonably convey that Appellants were in possession of the invention now claimed at the time of filing.

The issue presented is: Has the Examiner established that the subject matter of claims 13-15, 17, 19, and 21-25 does not meet the written description requirement of 35 U.S.C. § 112, first paragraph?

The Examiner contends that the Specification does not have written descriptive support for the subject matter of independent claim 13. Specifically, the Examiner contends that there is no support in the Specification for the etching of a tungsten layer in a tungsten etchback process “without photoresist present” to form a tungsten plug. (Ans. 3).

Appellants contend that the originally filed disclosure conveys to one skilled in the relevant art the concept of performing an etchback planarization process without photoresist present as shown by Figures 2B and 2C. (Br. 11). We agree. Claim 13 is directed to a process for removing residues from a tungsten plug structure having at least one tungsten plug and a tungsten layer. The Examiner has not pointed to portions of this record that would indicate that a tungsten plug structure would include a photoresist. Therefore we reverse.

The Examiner contends that the Specification does not have written descriptive support for alkanolamine as recited in claims 21 and 24. (Ans. 3).

Appellants contend that the originally filed disclosure describes representative alkanolamines and therefore provides written descriptive support for the subject matter of claims 21 and 24. (Br. 14). Having reviewed the Appellants' arguments and the portions of the record relied upon; we determine that Appellants have not convinced us of an error in the Examiner's determination that the Specification does not contain written descriptive support for the claimed invention. Appellants have not established that they were necessarily in possession of the genus alkanolamine as recited in claims 21 and 24. Appellants have not explained why a person of ordinary skill in the art would have envisaged the genus of alkanolamine from the disclosed species. See *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989) (two chemical compounds were insufficient description of subgenus); *In re Smith*, 458 F.2d 1389, 1394-95 (CCPA 1972) (disclosure of genus and one species was not sufficient description of intermediate subgenus). The rejection of claims 21 and 24 is affirmed.

#### The Prior Art Rejections.

We now turn to the prior art rejections.

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. See *In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)). Therefore, we look to Appellants' Brief to show error in the proffered *prima facie* case. See 37 C.F.R. § 41.37(c)(1)(vii) (2007).

A claimed invention is unpatentable if the differences between it and the prior art “are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.” 35 U.S.C. § 103. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). The question to be asked is “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.*

Based on the contentions of the Examiner and the Appellants, the issue presented for our review is: have Appellants shown reversible error in the Examiner’s conclusion that it would have been obvious to utilize the oxidant cleaning solution of Lee for removing oxidized metal residues from the metal plug as recited in claims 1 and 13?<sup>1</sup>

Appellants have not disputed the Examiner's finding that metal etchback processes are described by the admitted prior art in the Specification. (Note Spec. 007). Appellants also have not disputed that Chou, Shinohara, and Kadomura are representative of the admitted prior art. (Br. 19). Appellants have not disputed that Lee describes an oxidant solution for removal of metal residues. Appellants acknowledged that a claimed invention utilizes commercially available oxidant solutions, such as EKC270 available from EKC technology Inc. which is the assignee of the Lee reference. (Br. 16). Appellants have not explained why a person of

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<sup>1</sup> Appellants have not substantially argued the merits of the dependent claims. Therefore, the rejected claims will stand or fall with independent claims 1 and 13. 37 C.F.R. § 41.37(c)(1). We will also address the separately rejected claims.

ordinary skill in the art would have found the oxidant solution of Lee unsuitable for the stated purpose of removing metal residues.

Appellants' statements regarding claims 1, 9, 13, and 25 (Br. 20-23) are not persuasive of error in the Examiner's rejection. These statements provide a conclusory statement followed by the repetition of the respective claim language. These conclusory remarks are not tantamount to the requisite substantive arguments that set forth why the Examiner's rationale for the obviousness of the claimed features is in error.

Regarding the rejection of claims 3, 7, 11, 15, and 19, we find no error in the Examiner's conclusion that it would have been obvious to a person of ordinary skill in the art to utilize conventional methods to apply etching or cleaning solutions. (Ans. 6). Appellants have not asserted that the use of spraying methods for the application an etching or cleaning solutions in known prior art processes would have been unobvious to a person of ordinary skill in the art. Rather Appellants essentially relies upon arguments presented in rebuttal to the rejection of claims 1 and 13. (Br. 23-24).

#### ORDER

The rejection claims of 13-15, 17, 19, and 25 under 35 U.S.C. §112, first paragraph, is reversed.

The rejection claims of 21-24 under 35 U.S.C. § 112, first paragraph, is affirmed.

The rejection of claims 1-3, 5, 7, 9-15, 17, 19, and 21-25 under 35 U.S.C. § 103 as set forth in the stated rejections are affirmed.

Appeal 2008-002790  
Application 10/719,550

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(v).

AFFIRMED

PL Initial:  
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